APPLN. FILING DATE: OCTOBER 5, 2001
[illegible]E: THEOBROMINE SYNTHASE POLYPEPTIDE[illegible]OFFEE
[illegible]NT AND THE GENE ENCODING SAID POLYPE[illegible]
INVENTOR(S): HIROSHI SANO ET AL
APPLICATION SERIAL NO: UNASSIGNED **SHEET 1 of 6**

FIG. 1

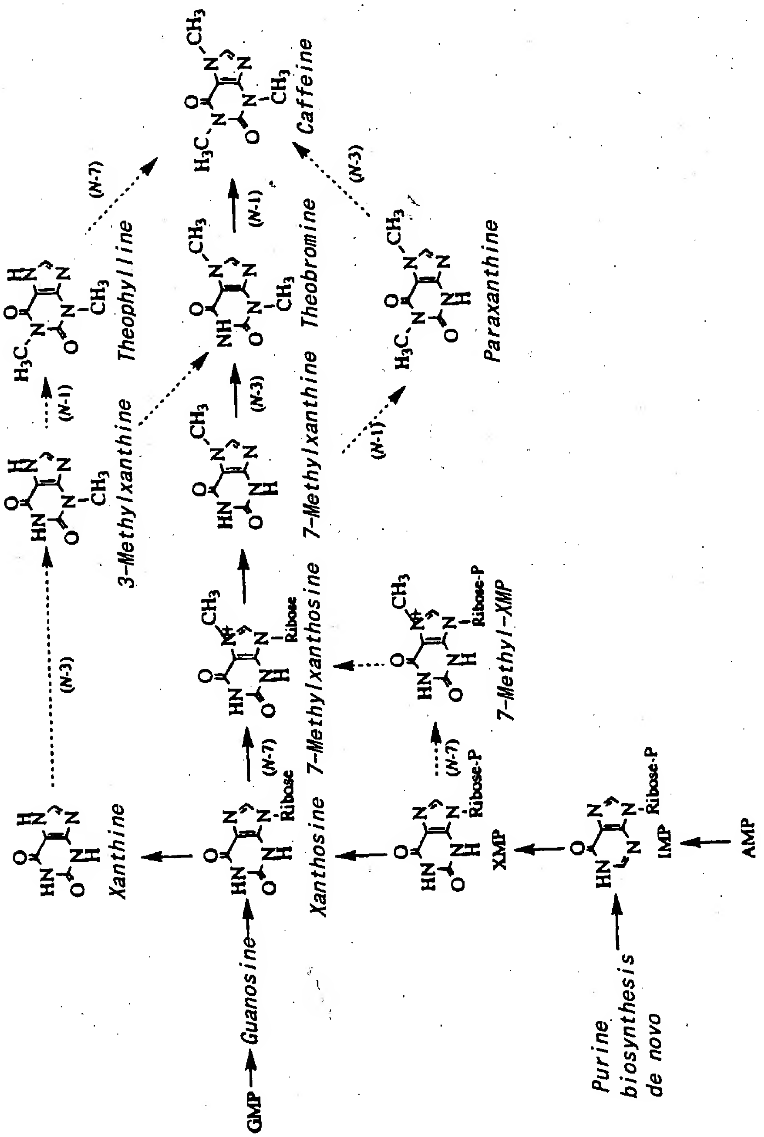

FIG. 2

A

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GTCCTGCATA TGAATGGAGC TCCAAGAAGT CCTGCATATG AATGGAGGCG AAGGCGAAGC AAGCTACGCC AAGAATTCAT CCTTCAATCA    90
ACTGGTTCTC GCCAAGGTGA AACCTGTCCT TGAACAATGC GTACGGGAAT TGTTGCGGGC CAACTTGCCC AACATCAACA AGTGCATTAA   180
AGTTGCAGAT TTGGGATGCG CTTCCGGACC AAACACACTT TTAACCGTTT GGGACACTGT ACAAAGTATT GACAAAGTTA AGCAAGAAAT   270
GAAGAATGAA TTAGAACGTC CCACCATTCA GGTTTTTCTG ACTGATCTTT TCCAAAATGA TTTCAATTCG GTTTTCATGC TGCTGCCAAG   360
CTTCTACCGC AAACTTGAGA AAGAAAATGG ACGCAAAATA GGATCGTGCC TAATAGCCGC AATGCCTGGC TCTTTCCACG GCAGACTCTT   450
CCCCGAGGAG TCCATGCATT TTTTACACTC TTCTTACAGT CTTCAGTTTT TATCCCAGGT TCCCAGCGGT TTGGTGACTG AATTGGGGAT   540
CACTGCGAAC AAAAGGAGCA TTTACTCTTC CAAAGCAAGT CCTCCGCCCG TCCAGAAGGC ATATTTGGAT CAATTTACGA AAGATTTTAC   630
CACATTTTTA AGGATGCGTT CGGAAGAGTT GCTTTCACGT GGCCGAATGC TCCTTACTTG CATTTGTAAA GGAGATGAAT GCGACGGCCC   720
GAATACCATG GACTTACTTG AGATGGCAAT AAACGACTTG GTTGCTGAGG GACGTCTGGG GGAAGAAAAA TTGGACAGTT TCAATGTTCC   810
AATCTATACA GCTTCAGTAG AAGAAGTAAA GTGCATGGTT GAGGAGGAAG GTTCTTTTGA AATTTTATAC TTGCAGACTT TTAAGCTCCG   900
TTATGATGCT GGCTTCTCTA TTGATGATGA TTGCCAAGTA AGATCCCATT CCCCAGTATA CAGCGATGAA CATGCTAGAG CAGCGCATGT   990
GGCATCATTA ATTAGATCAG TTTACGAACC CATCCTAGCA AGTCATTTTG GAGAAGCTAT TATACCTGAC ATATTCCACA GGTTTGCGAC  1080
GAATGCAGCA AAGGTTATCC GCTTGGGCAA AGGCTTCTAT AATAATCTTA TCATTTCTCT TGCCAAAAAA CCAGAGAAGT CAGACATATA  1170
AAAGCTTGTT TTTAGTTGGT TTTTGTGTTA TGGGTTGTTT TCTGATACGG GGAAAGGATT CAGTGCGGTT GGGGTTCTAT CCGAGTATTG  1260
TACTTTTTAT ATTATTAGTT GGTGTATAAT TATTATGTTA CATTGTTATA TTCGTAATAA AAGTGACGTA CAAAAATAAA ATATTTTCAT  1350
AAAAAAAAAA                                                                                          1360
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B

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TTTAGCAGTC CCAATTCGAT TTATGTACAA GTCCTGCATA TGAATGGAGC TCCAAGAAGT CCTGCATATG AATGGAGGCG AAGGCGATGC    90
AAGCTACGCC AAGAATTCAT CCTTCAATCA ACTGGTTCTC GCCAAGGTGA AACCTGTCCT TGAACAATGC GTAGGGGAAT TGTTGCGGGC   180
CAACTTGCCC AACATCAACA AGTGCATTAA AGTTGCGGAT TTGGGATGCG CTTCCGGACC AAACACACTT TTAACAGTTC GGGACATTGT   270
ACAAAGTATT GACAAAGTTA GGCAAGAAAT GAAGAATGAA TTAGAACGTC CCACCATTCA GGTTTTTCTG ACTGATCTTT TCCAAAATGA   360
TTTCAATTCG GTTTTCATGT TGCTGCCAAG TTTCTACCGC AAACTTGAGA AAGAAAATGG ACGCAAGATA GGATCGTGCC TAATAGCCGC   450
AATGCCTGGC TCTTTCCACG GCAGACTCTT CCCCGAGGAG TCAATGCATT TTTTACACTC TTCTTACAGT CTTCAATTTT TATCCCAGGT   540
TCCCAGCGGT TTGGTGACTG AATTGGGGAT CACTGCGAAC AAAAGGAGCA TTTACTCTTC CAAAGCAAGT CCTCCGCCCG TCCAGAAGGC   630
ATATTTGGAT CAATTTACGA AAGATTTTAC CACATTTTTA AGGATTCGTT CGGAAGAGTT GCTTTCACGC GGCCGAATGC TCCTTACTTG   720
CATTTGCAAA GGAGATGAAT TCGACGGCCC GAATACCATG GACTTACTTG AGATGGCAAT AAACGACTTG GTTGTTGAGG GACATCTGGA   810
GGAAGAAAAA TTGGACAGTT TCAATGTTCC AATCTATGCA GCTTCAGTAG AAGAATTAAA GTGCATAGTT GAGGAGGAAG GTTCTTTTGA   900
AATTTTGTAC TTGGAGACTT TTAAGCTCCG TTATGATGCT GGCTTCTCTA TTGATGATGA TTGCCAAGTA AGATCCCATT CCCCAGAATA   990
CAGCGATGAA CATGCTAGAG CAGCGCATGT GGCATCATTA CTTAGATCAG TTTACGAACC CATCCTCGCA AATCATTTTG GAGAAGCTAT  1080
TATACCTGAC ATATTCCACA GGTTTGCGAC GAATGCAGCA AAGGTTATCC GCTTGGGCAA AGGCTTCTAT AATAATCTTA TCATTTCTCT  1170
TGCCAAAAAA CCAGAGAAGT CAGACATATA AAAGCTTGTT TATAGTTGGT TTTTGTGCTA TGGTTTGTTT TCTGATACGG GGAAAGGATT  1260
TAGTGCGGTT GGGGTTCAAA AAAAAAAAAA AAAAAAAAAA AAAA                                                    1304
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C

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CTTTGGCAGT CCCAATTTGA TTTATGTACA AGTCCTGCAT ATGAATGGAG CTCCAAGAAG TCCTGCGGAT GAATGGAGGC GAAGGCGATA    90
CAAGCTACGC CAAGAATTCA GCCTACAATC AACTGGTTCT CGCCAAGGTG AAACCTGTCC TTGAACAATG CGTACGGGAA TTGTTGCGGG   180
CCAACTTGCC CAACATCAAC AAGTGCATTA AAGTTGCGGA TTTGGGATGC GCTTCTGGAC CAAACACACT TTTAACAGTT CGGGACATTG   270
TCCAAAGTAT TGACAAAGTT GGCCAGGAAA AGAAGAATGA ATTAGAACGT CCCACCATTC AGATTTTTCT GAATGATCTT TTCCCAAATG   360
ATTTCAATTC GGTTTTCAAG TTGCTGCCAA GCTTCTACCG CAAACTTGAG AAAGAAAATG GACGCAAAAT AGGATCGTGC CTAATAGGGG   450
CAATGCCCGG CTCTTTCTAC AGCAGACTCT TCCCCGAGGA GTCCATGCAT TTTTTACACT CTTGTTACTG TCTTCAATGG TTATCTCAGG   540
TTCCTAGCGG TTTGGTGACT GAATTGGGGA TCAGTACGAA CAAAGGGAGC ATTTACTCTT CCAAAGCAAG TCGTCTGCCC GTCCAGAAGG   630
CATATTTGGA TCAATTTACG AAAGATTTTA CCACATTTCT AAGGATTCAT TCGGAAGAGT TGTTTTCACA TGGCCGAATG CTCCTTACTT   720
GCATTTGTAA AGGAGTTGAA TTAGACGCCC GGAATGCCAT AGACTTACTT GAGATGGCAA TAAACGACTT GGTTGTTGAG GGACATCTGG   810
AGGAAGAAAA ATTGGATAGT TTCAATCTTC CAGTCTATAT ACCTTCAGCA GAAGAAGTAA AGTGCATAGT TGAGGAGGAA GGTTCTTTTG   900
AAATTTTATA CCTGGAGACT TTTAAGGTCC TTTACGATGC TGGCTTCTCT ATTGACGATG AACATATTAA AGCAGAGTAT GTTGCATCTT   990
CCGTTAGAGC AGTTTACGAA CCCATCCTCG CAAGTCATTT TGGAGAAGCT ATTATACCTG ACATATTCCA CAGGTTTGCG AAGCATGCAG  1080
CAAAGGTTCT CCCCTTGGGC AAAGGCTTCT ATAATAATCT TATCATTTCT CTCGCCAAAA AGCCAGAGAA GTCAGACGTG TAAAAGTTTG  1170
TTTTTGTGTT GGGGAAAGGA ATAAGTGCCG TTGGGGGTCT TTCGGGTATT GTGCTTTTTA TATTATATTG TTTTGTATCC GTAATAAAAG  1260
TGGTGTGTAA GAATAAGATA TTTGACATAT ATTATTTTCA AAAAAAAAAA AAAAAA                                       1316
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D

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AGCAGTCGCA ATTCGATTGT CCTGCATATG AATGGAGCTC CAAGAAGTCC TGCATATGAA TGAAGGTGAA GGCGATACAA GCTACGCCAA    90
GAATGCATCC TACAATCTGG CTCTTGCCAA GGTGAAACCT TTCCTTGAAC AATGCATACG AGAATTGTTG CGGGCCAACT TGCCCAACAT   180
CAACAAGTGC ATTAAAGTTG CGGATTTGGG ATGCGCTTCT GGACCAAACA CACTTTTAAC AGTGCGGGAC ATTGTGCAAA GTATTGACAA   270
AGTTGGCCAG GAAGAGAAGA ATGAATTAGA ACGTCCCACC ATTCAGATTT TTCTGAATGA TCTTTTCCAA AATGATTTCA ATTCGGTTTT   360
CAAGTTGCTG CCAAGCTTCT ACCGCAAACT CGAGAAAGAA AATGGACGCA AGATAGGATC GTGCCTAATA AGCGCAATGC CTGGCTCTTT   450
CTACGGCAGA CTCTTCCCCG AGGAGTCCAT GCATTTTTTG CACTCTTGTT ACAGTGTTCA TTGGTTATCT CAGGTTCCCA GCGGTTTGGT   540
GATTGAATTG GGGATTGGTG CAAACAAAGG GAGTATTTAC TCTTCCAAAG GATGTCGTCC GCCCGTCCAG AAGGCATATT TGGATCAATT   630
TACGAAAGAT TTTACCACAT TTCTAAGGAT TCATTCGAAA GAGTTGTTTT CACGTGGCCG AATGCTCCTT ACCTGCATTT GTAAAGTAGA   720
TGAATTCGAC GAACCGAATC CCCTAGACTT ACTTGACATG GCAATAAACG ACTTGATTGT TGAGGGACTT CTGGAGGAAG AAAAATTGGA   810
TAGTTTCAAT ATTCCATTCT TTACACCTTC AGCAGAAGAA GTAAAGTGCA TAGTTGAGGA GGAAGGTTCT TGCGAAATTT TATATCTGGA   900
GACTTTTAAG GCCCATTATG ATGCTGCCTT CTCTATTGAT GATGATTACC CAGTAAGATC CCATGAACAA ATTAAAGCAG AGTATGTGGC   990
ATCATTAATT AGATCAGTTT ACGAACCCAT CCTCGCAAGT CATTTTGGAG AAGCTATTAT GCCTGACTTA TTCCACAGGC TTGCGAAGCA  1080
TGCAGCAAAG GTTCTCCACA TGGGCAAAGG CTGCTATAAT AATCTTATCA TTTCTCTCGC CAAAAAGCCA GAGAAGTCAG ACGTGTAAAA  1170
GTTTGTTTTT AGTTGGTTTT TGTGCCGTTG GGGGTCTTTC GGGTATTGTC GTTTTGTATT CGTAATAAAA GTGATGTGCA AGAATAAGAT  1260
ATTTAGTACA ATATTTTCAT AAAAAAAAAA AAAAAAAA                                                           1298
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FIG. 3

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MXMT1   MELQEVLHMNEGEGDTSYAKNASYN-LALAKVKPFLEQCIRELLRANLPN   49
MTL1    ::::::::::G:::EA:::::S:F:Q:V::::::V::::V::::::::::   50
MTL2    ::::::::::G::::A:::::S:F:Q:V::::::V::::VG:::::::::   50
MTL3    :::::::R::G::::::::::SA::Q:V::::::V::::V::::::::::   50

MXMT1   INKCIKVADLGCASGPNTLLTVRDIVQSIDKVGQEEKNELERPTIQIFLN   99
MTL1    ::::::::::::::::::::::W:T:::::::K::M::::::::::V::T  100
MTL2    ::::::::::::::::::::::::::::::::R::M::::::::::V::T  100
MTL3    :::::::::::::::::::::::::::::::::::K::::::::::::::  100

MXMT1   DLFQNDFNSVFKLLPSFYRKLEKENGRKIGSCLISAMPGSFYGRLFPEES  149
MTL1    :::::::::::M::::::::::::::::::::::A::::::H::::::::  150
MTL2    :::::::::::M::::::::::::::::::::::A::::::H::::::::  150
MTL3    :::P::::::::::::::::::::::::::::::::::::::S:::::::  150

MXMT1   MHFLHSCYSVHWLSQVPSGLVIELGIGANKGSIYSSKGCRPPVQKAYLDQ  199
MTL1    ::::::S::LQF:::::::::T::::T:::R::::::ASP::::::::::  200
MTL2    ::::::S::LQF:::::::::T::::T:::R::::::ASP::::::::::  200
MTL3    ::::::::CLQ::::::::::T::::ST:::::::::AS:L:::::::::  200

MXMT1   FTKDFTTFLRIHSKELFSRGRMLLTCICKVDEFDEPNPLDLLDMAINDLI  249
MTL1    ::::::::::MR:E::L::::::::::::G::C:G::TM:::E::::::V  250
MTL2    :::::::::::R:E::L::::::::::::G::::G::TM:::E::::::V  250
MTL3    :::::::::::::E::::H::::::::::GE:L:AR:AI:::E::::::V  250

MXMT1   VEGLLEEEKLDSFNIPFFTPSAEEVKCIVEEEGSCEILYLETFKAHYDAA  299
MTL1    A::R:G::::::::V:IY:A:V:::::M::::::F:::::Q:::LR:::G  300
MTL2    :::H::::::::::V:IYAA:V::L:::::::::F:::::::::LR:::G  300
MTL3    :::H::::::::::L:VYI:::::::::::::::F:::::::::VL:::G  300

MXMT1   FSIDDDYPVRSH------EQIKAEYVASLIRSVYEPILASHFGEAIMPDL  343
MTL1    ::::::CQ:::SPVYSD:HAR:AH::::::::::::::::::::::I::I  350
MTL2    ::::::CQ:::SPEYSD:HAR:AH::::L::::::::::N::::::I::I  350
MTL3    :::::EH-------------::::::::SV:A::::::::::::::I::I  337

MXMT1   FHRLAKHAAKVLHMGKGCYNNLIISLAKKPEKSDV  378
MTL1    :::F:TN:::IRL:::F:::::::::::::::::I  385
MTL2    :::F:TN:::IRL:::F:::::::::::::::::I  385
MTL3    :::F:::::::PL:::F::::::::::::::::::  372
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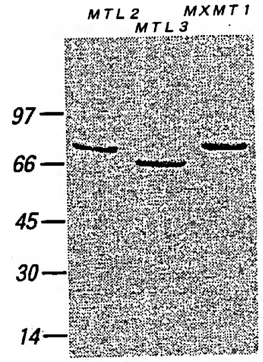
FIG. 4



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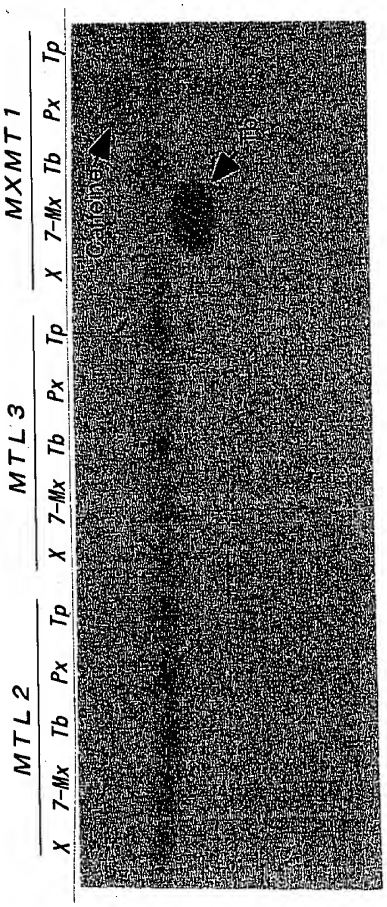
T[illegible]E: THEOBROMINE SYNTHASE POLYPEPTIDE[illegible]OFFEE
P[illegible]T AND THE GENE ENCODING SAID POLYPEPT[illegible]
INVENTOR(S): HIROSHI SANO ET AL
APPLICATION SERIAL NO: UNASSIGNED **SHEET 5 of 6**

FIG. 5



APPLN. FILING DATE: OCTOBER 5, 2001
TITLE: THEOBROMINE SYNTHASE POLYPEP[illegible]S OF COFFEE PLANT AND THE GENE ENCODING SAID POL[illegible]TIDE
INVENTOR(S): HIROSHI SANO ET AL
APPLICATION SERIAL NO: UNASSIGNED
SHEET 6 of 6

FIG. 6